

ABSTRACT OF THE DISCLOSURE

Prestack seismic data is imaged by calculating an individual reflectivity for each frequency in the seismic data. Then, a mean reflectivity is calculating over the individual reflectivities. A variance is calculated for the set of reflectivities versus frequency. A second variance is calculated for the upgoing wavefield, using the mean reflectivity. A spatially varying pre-whitening factor is then calculated, using the variance for the reflectivities and the variance for the upgoing wavefield. A reflectivity is calculated at each location, using the spatially varying pre-whitening factor.